

WHAT IS CLAIMED IS:

1. A liquid container detachably mountable on a vertically upward aperture, which comprises having a flat shape and being provided on the bottom thereof
5 with independent two fluid connection ports for communicating a liquid chamber with the exterior of the container, wherein said two connection ports are provided close to an end portion of the bottom.

10 2. A liquid container according to claim 1, wherein the external shape and the internal space of the liquid container are pointed toward the bottom thereof.

15 3. A liquid container according to claim 1, wherein the two fluid connection ports are positioned on a line passing through the approximate center of the shorter side of the flat shape of the liquid container.

20 4. A liquid container according to claim 1, wherein a fluid connection port closer to the end of the bottom of the liquid container is used for enabling derivation of the liquid of the liquid
25 chamber.

5. A liquid container according to claim 4,

10057353-020702

wherein a member for filtering the derived liquid is so provided as to cover the aperture of said fluid connection port close to the end portion of said liquid chamber.

5

6. A liquid container according to claim 1, wherein a fluid connection port closer to the center of the bottom of the liquid container among the fluid connection ports positioned in the end portion of the liquid container bottom is used for enabling air introduction.

7. A liquid container according to any of claims 1 to 6, wherein a tubular member protrudes in said liquid chamber toward the ceiling thereof, so as to surround the periphery of the aperture of said fluid connection port closer to the center, except for the direction toward the ceiling.

8. A liquid container according to claim 1, comprising a structure for perturbing the rising motion of bubbles in an upper space where air bubbles rise from the internal bottom of the tubular member along with the liquid derivation in a state where said liquid container is connected with a recording apparatus.

10067358.020702

9. A liquid container according to claim 8,
wherein said structure is a rib connecting two faces
of largest area mutually opposed in said liquid
container of flat shape.

5

10. A liquid container according to claim 8,
containing recording liquid which contains pigment.

11. A liquid container according to claim 1,
10 wherein the two fluid connection ports are provided
with elastic members for sealing the liquid chamber.

12. A liquid container according to claim 1,
comprising an identification information structure
15 for mechanically holding identification information
of the liquid container, so as to substantially
perpendicularly protruding from a face continuous to
and crossing the longitudinal end of the oblong
bottom of the liquid container.

20

13. A liquid container according to claim 1,
wherein an area in the container bottom not provided
with the fluid connection ports includes an
information memory element capable of holding the
25 identification information of the liquid container
and composed of an electric, magnetic, optical or
combined system.

10067353-020702

14. A liquid container according to claim 13,
wherein said information memory element is capable,
in addition to the readout of the memorized
information from the exterior of the liquid container,
5 of alteration, deletion or additional writing of the
memorized information.

15. A liquid supply system utilizing the liquid
container according to any of claims 1 to 6, 8 to 14,
10 wherein an air introducing connection needle and a
liquid deriving connection needle are respectively
connected to the two connection ports in the bottom
of the liquid container.

15 16. A liquid supply system utilizing the liquid
container according to any of claims 1 to 6, 8 to 14,
comprising:

an air introducing connection needle and a liquid
deriving connection needle to be respectively
20 connected to the two connection ports in the bottom
of the liquid container;

wherein said air introducing connection needle is
so positioned as to remain within said tubular member
and the height of said liquid deriving connection
25 needle is approximately same as that of said air
introducing connection needle.

10067358.020702

10657358 020702

17. A liquid supply system according to claim 16,
wherein said liquid supply system is to supply a
liquid discharge head with liquid, and said liquid
discharge head is an ink jet head for pushing out the
5 liquid in a nozzle by thermal or vibration energy
thereby causing a liquid droplet to fly.

18. An ink jet recording apparatus capable
detachably mounting the liquid container according to
10 any of claims 1 to 6, 8 to 14.

19. A mounting method for a liquid container
according to any of claims 1 to 6, 8 to 13, and
detachably mountable on an ink jet recording
15 apparatus in which a connection member with said
liquid container extends in a direction opposed to
the mounting direction of said liquid container, the
method comprising:

a step of guiding the liquid container
20 principally utilizing the external shape portion in
the projection plane in the inserting direction until
the front end portion of a connection member of the
recording apparatus enters a connection member
introduction guide portion provided at the entrance
25 of the fluid connection port of the bottom of the
liquid container;

a step of relaxing the positional defining by

said external shape portion after the front end portion of the connection member enters the guide portion of the fluid connection port in the bottom of the liquid container;

- 5 a succeeding step of executing entry of the connection member into the fluid connection port; and
 a succeeding step of starting the connection of a connector corresponding to an information memory element with the information memory element.

10

20. A liquid container comprising:
a liquid chamber containing liquid;
a liquid supply portion provided in the bottom portion of said liquid chamber for supplying the
15 liquid in said liquid chamber to the exterior;
an air introducing portion provided in the bottom portion of said liquid chamber and adapted to introduce air into said liquid chamber so as to maintain a constant pressure in said liquid chamber
20 along with the liquid supply by said liquid supply portion; and
a liquid agitating structure provided inside said liquid chamber and adapted to agitate the liquid in said liquid chamber, utilizing liquid flow generated
25 in said liquid chamber by the air introduction from said air introducing portion into said liquid chamber.

10067358.020702

21. A liquid container according to claim 20,
wherein said liquid agitating structure is composed
of at least a rib provided protruding from the
internal wall of said liquid chamber in a position
5 collided directly or indirectly by a liquid flow
generated in said liquid chamber.

22. A liquid container according to claim 21,
wherein said rib is positioned higher than said air
10 introducing portion.

23. A liquid container according to claim 21,
wherein said rib is provided between said liquid
supply portion and said air introducing portion.
15

24. A liquid container according to claim 21,
wherein said rib is provided on mutually opposed
positions of mutually opposed two internal wall faces
of said liquid chamber.
20

25. A liquid container according to claim 21,
wherein said rib is a pillar-shaped member connecting
the mutually opposed two internal wall faces of said
liquid chamber.
25

26. A liquid container according to claim 25,
wherein said pillar-shaped member is provided in a

10067358.020702

position collided by a rising liquid flow generated in said liquid chamber.

27. A liquid container according to claim 21,
5 wherein said pillar-shaped member is provided higher than said air introducing portion and between said liquid supply portion and said air introducing portion.

10 28. A liquid container according to claim 27, wherein said pillar-shaped member is provided in plural units with a gap therebetween in the vertical direction of said liquid chamber.

15 29. A liquid container according to claim 20, wherein said liquid supply portion is provided at a corner portion of said liquid chamber.

20 30. A liquid container according to claim 20, wherein said liquid supply portion and said air introducing portion are provided in mutually adjacent manner.

25 31. A liquid supply system comprising:
a liquid container according to any of claims 1 to 6, 8 to 11;
liquid supply means connected with said liquid

10067358.020702

supply portion of said liquid container for supplying the liquid in said liquid chamber to the exterior of said liquid chamber; and

air introducing means connected with said air
5 introducing portion of said liquid container thereby causing the interior of said liquid chamber to communicate with the air.

32. A liquid supply system according to claim
10 31, further comprising suction means for forcedly sucking the liquid in said liquid chamber through said liquid supply means.

33. A liquid supply system according to claim
15 31, wherein said liquid chamber is closed by sealing said liquid supply portion and said air introducing portion respectively with seal members; and

said liquid supply means and said air introducing means respectively include needle-shaped members for
20 penetrating said seal members.

34. A liquid container comprising:
a liquid chamber directly containing liquid;
a liquid supply portion provided in the bottom
25 portion of said liquid chamber for supplying the liquid in said liquid chamber to the exterior;
an air introducing portion provided in the bottom

10067358-1020702

portion of said liquid chamber and adapted to
introduce air into said liquid chamber so as to
maintain a constant pressure in said liquid chamber
along with the liquid supply by said liquid supply
5 portion; and

at least a rib provided protruding from the
internal wall face of said liquid chamber;

wherein said liquid supply portion and said air
introducing portion are provided mutually close and
10 in a deviated manner close to an end of the liquid
chamber.

35. A liquid container according to claim 34,
wherein said rib is positioned higher than said air
15 introducing portion.

36. A liquid container according to claim 34,
wherein said rib is provided between said liquid
supply portion and said air introducing portion.
20

37. A liquid container according to claim 34,
wherein said rib is provided on mutually opposed
positions of mutually opposed two internal wall faces
of said liquid chamber.
25

38. A liquid container according to claim 34,
wherein said rib is a pillar-shaped member connecting

10067358.020702

the mutually opposed two internal wall faces of said liquid chamber.

39. A liquid container according to claim 38,
5 wherein said pillar-shaped member is provided in a position collided by a rising liquid flow generated in said liquid chamber.

40. A liquid container according to claim 38,
10 wherein said pillar-shaped member is provided higher than said air introducing portion and between said liquid supply portion and said air introducing portion.

41. A liquid container according to claim 40,
15 wherein said pillar-shaped member is provided in plural units with a gap therebetween in the vertical direction of said liquid chamber.

42. An ink jet recording apparatus for
20 discharging liquid ink for recording on a recording medium, comprising:

holding means for detachably holding a recording head for executing recording by discharging ink;

25 a liquid container according to any of claims 1 to 6, 8 to 14, 17, 20 to 23 for containing ink to be supplied to said recording head;

10067358.020702

a liquid supply unit for connecting said recording head and said liquid supply portion of said liquid container thereby supplying ink in said liquid chamber to said recording head along with the ink discharge from said recording head and communicating the interior of said liquid chamber with the air through said air introducing portion of said liquid container; and

suction means for forcedly sucking the ink in said recording head.

43. A liquid agitating method for agitating the liquid in a liquid container including a liquid chamber containing liquid; a liquid supply portion provided in the bottom portion of said liquid chamber for supplying the liquid in said liquid chamber to the exterior; an air introducing portion provided in the bottom portion of said liquid chamber and adapted to introduce air into said liquid chamber; and a rib provided on the internal wall of said liquid chamber, the method comprising:

a step of supplying the liquid in said liquid chamber from said liquid supply portion to the exterior; and

a step of introducing air from said air introducing portion into said liquid chamber so as to maintain constant the pressure in said liquid chamber,

10067358.020702

decreasing by the liquid supply from said liquid supply portion to the exterior, and generating a flow in the liquid in said liquid chamber directed directly or indirectly toward said rib.

5

44. A liquid agitating method according to claim 43, wherein said step of supplying liquid from said liquid supply portion to the exterior includes a step of forcedly sucking the liquid in said liquid chamber.

10067358.020702